



***DARPA*Tech**

2002 Symposium

Transforming
Fantasy



Timothy Grayson
Program Manager,
Tactical
Technology Office



Space Situation Awareness: A Solution to “Lost in Space”

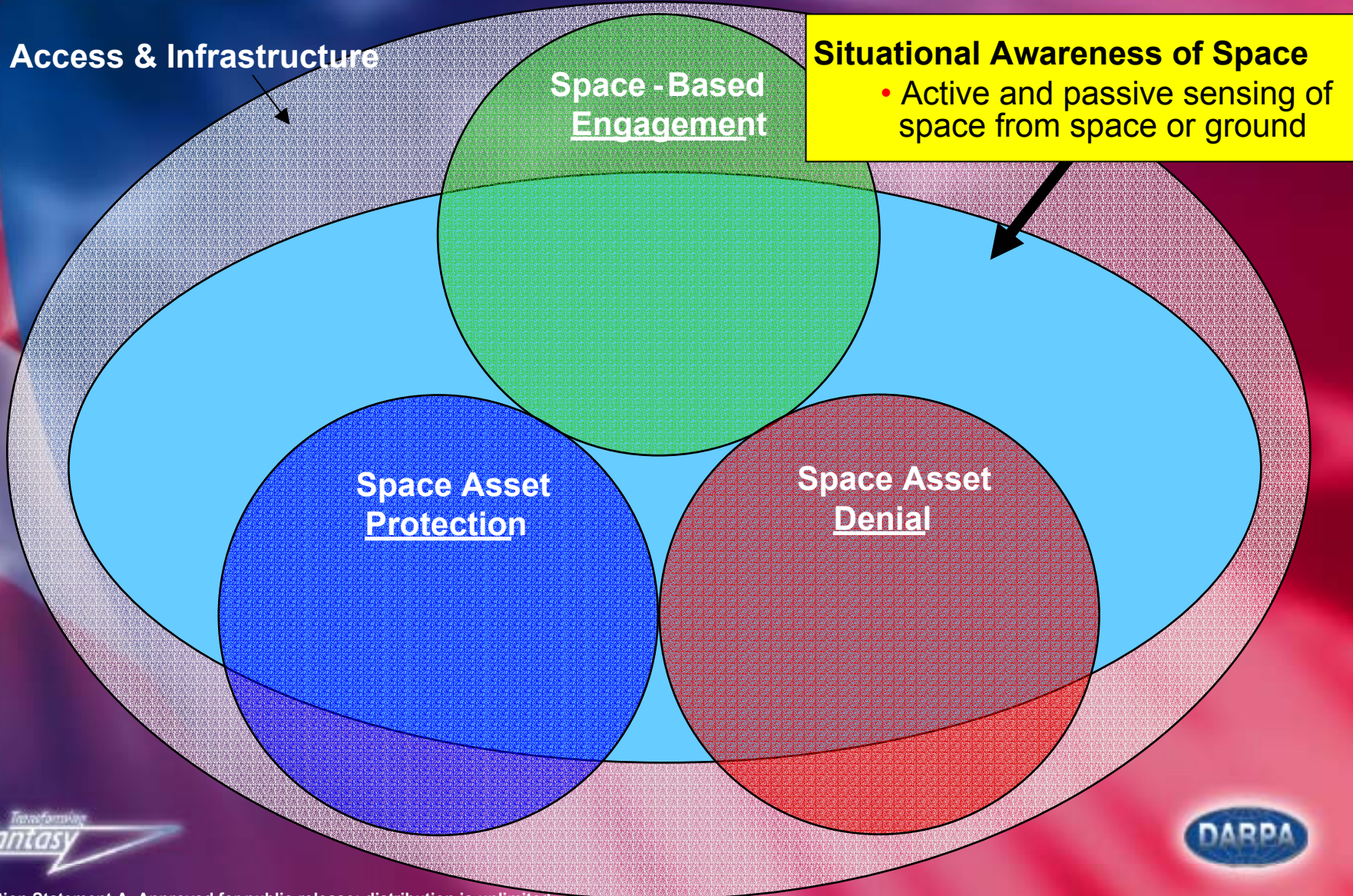
Timothy P. Grayson, Ph.D.

Space Situation Awareness

- ▶ Where is it? – Position, Track
- ▶ What is it? – Satellite vs. Debris
- ▶ What is it doing? – Status, Health Monitoring



Space Situational Awareness



SSA Approach

- ▶ Current system: Catalog-centric
 - System overload and timelines
 - Small objects
 - Unknowns
- ▶ Approach:
 - New sensors
 - System focus
 - Automated control

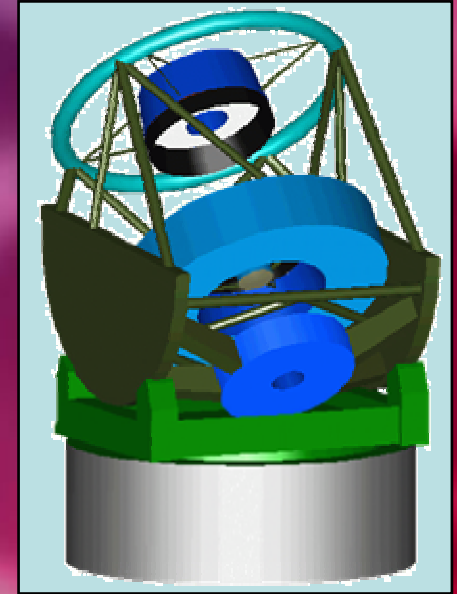


SSA Sensors

| | Search | Identify / Characterize |
|-----|---------|---|
| LEO | RF | EO or RF |
| GEO | EO: SST | RF: Deep View On-orbit: Orbital Express |

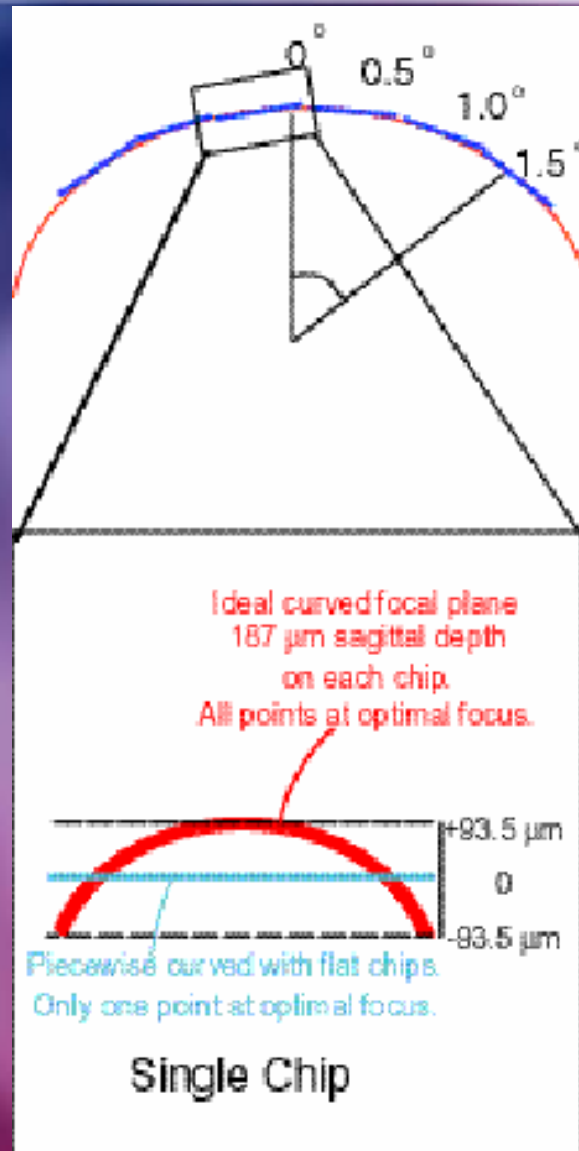
Space Surveillance Telescope

- ▶ Develop large aperture, wide-field-of-view telescope
 - Un-cued search
 - Microsats, debris, asteroids



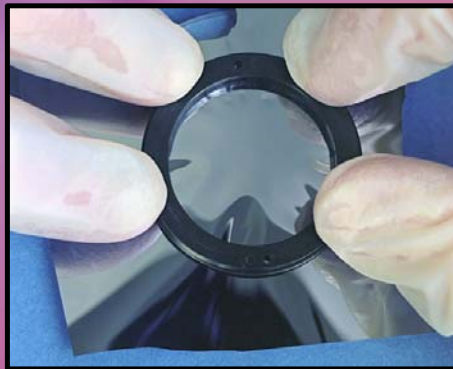
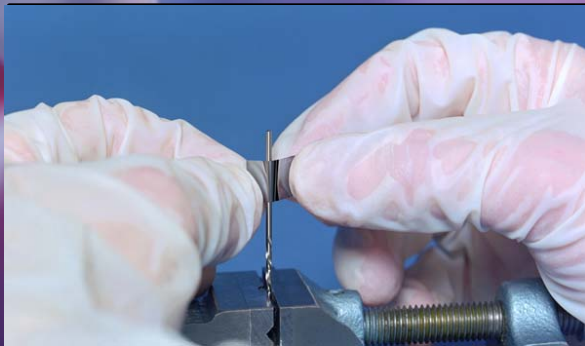
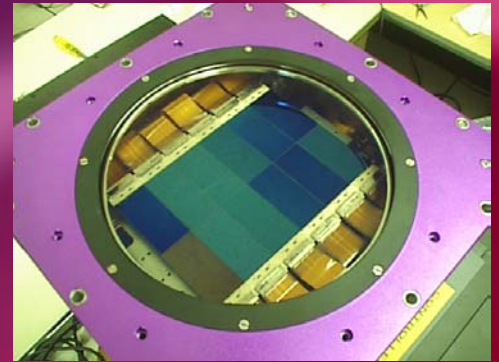
- ▶ Technical Approach
 - Curved focal plane array
 - Next-generation optics

Why Curved Focal Planes?



DARPA/MTO Curved FPA

- ▶ Demonstrated mechanical integrity
- ▶ Demonstrated electronic integrity

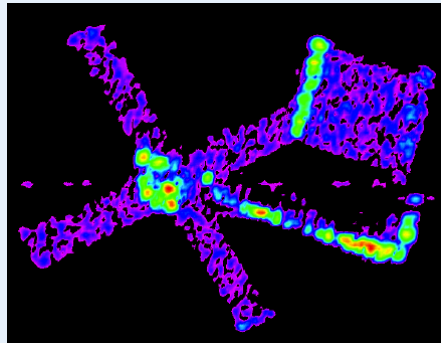


Deep View Objective

Develop a ground-based wide-band radar system for timely, high-resolution satellite imaging at GEO

New Sensors

Radar Images



New Signal Processing

Derived Information

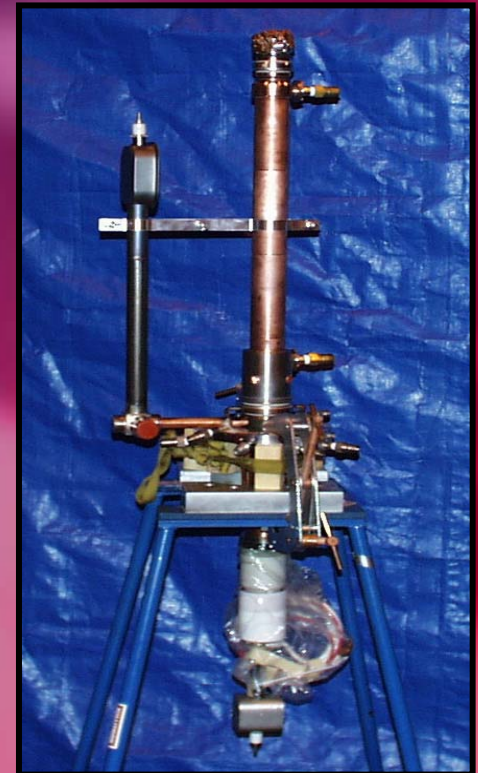
Space Situational Awareness



Transmitter Technology

- ▶ High Power
- ▶ High Bandwidth
- ▶ W-Band

Power
Combining



SSA Program Plan

▶ SST

- System study
- Large-area, light-weight optics study
- Demonstration system by FY08

▶ Deep View

- Transmitter tube technology study
- Signal processing algorithms
- Demonstration by FY08





***DARPA*Tech**

2002 Symposium

Transforming
Fantasy